Mode of socio-economic development and occupational structure: the case of contemporary Russia

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Mode of Socio-Economic Development and Occupational Structure: The Case of Contemporary Russia*

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Abstract The given paper assumes the existence of a correlation between the occupational structure and the mode of social and economic development of a country. It is shown that the modern stage of development in advanced economies could be described by the post-industrial phase with (a) the specific proportions in the occupational structure (predominance of professional managers and technical experts); (b) particular nature of work and the corresponding extent of labor division according to specialization and qualification (highly skilled labor with broad specialization and a new criterion of creativity included within qualifications). Within the certain historical framework these indicators, combined onto the entire scheme, produce the criteria to distinct different types of socio-economic development and arrange them in consistent order. The analysis of occupational structure of Russian population shows that the reforms of 1990s have facilitated the process of deindustrialization alongside with the growth of semi- and low-skilled jobs. According to the scheme, Russia seems to have reached the stage of the development that is similar to one of the 1950–1960s in the USA and the Europe.

Keywords Occupational structure Socio-economic development Knowledge based economy Industrialization Labour potential Modernization Russia

JEL Classification J21 O14 P20

Introduction

Modernization rhetoric is still popular in Russia even despite the 20 years of reforms have passed since disintegration of the Soviet Union occurred in early 1990s of the

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last century. What does remain a stumbling block for Russia in overcoming this transition shift? To answer this question one should identify the mode of socioeconomic development that Russia has stuck in. There are a few analytical ways how to do this. One of the most functional and apprehensible amidst them is a labour potential approach (Fairbairn 1967). In many aspects labour potential of the population is determined by occupational structure evolution of which in any country tends to be an actual subject area of analysis the prospects of a country's social and economic development especially when transition ones are concerned.

The given paper consists of two main parts. First one is devoted to aim of constructing an analytical schema which represents the relationship between type of socio-economic development and occupational structure. Another part considers the changes in occupational structure of Russian population over the transition phase between 1994 and 2010 in accordance with regarded theoretical framework. This kind of analysis is aimed not only to evaluate the chances of Russian population to successful modernization but also to prove that occupational structure could be a relevant indicator of a country's mode of social and economic development.

Occupational Structure as Indicator of a Stage of Socio-Economic Development

Labour potential approach assumes that the prospects of a country's social and economic development are determined to a great extent by the quality of the human resources of the occupied population (Fairbairn 1967). At the same time, the specific characteristics of the labour potential of the population pretty much depend upon its occupational composition (Goldthorpe 2002). One can receive a nuanced illustration of this if to imagine a kaleidoscope of viewpoints and opinions, related, on the one hand, to the interpretation of the conditions in which the model of the population's occupational structure both in developed countries and in Russia are currently being formed, and on the other hand, to the extent to which the changes in the occupational structures indicate an economic advancement.

The fundamental context under which the evolution of the domestic occupational structures is at present taking place should be described foremost in terms of the role that knowledge plays in the modern world. Since the 1970s,many researchers have focused their attention on the significance of qualifications in the determination of a society's social and economic development. (Bell 1999; Castells 1998; Powell and Snellman 2004). As far as international studies of the global economy are concerned, 'qualification level' is widely used as a criterion for advanced economies' industry classification. For example, according to the pre-crisis public Report issued by the International Monetary Fund on the year 2007 'Spillovers and Cycles in the Global Economy' (World Economic Outlook 2007) skilled labour is occupied with fuel, chemical, rubber industries, engineering, business-consulting, social and personal services. Unskilled labour is concerned by the authors to be concentrated in agriculture, mining, food and tobacco, textile, apparel and leather, timber and other non-metal industries, metallurgy and construction (World Economic Outlook 2007, p 182).

Notwithstanding the debatable character of such a classification based on industry topology it is about to identify some general trends that have been taking

place amidst the countries with advanced economies but only since the 1980s. They are: (a) a steady increase in a share of employed population occupied with the industries that require the use of high qualified labour (up to 45 % between 1980 and 2000); (b) expanding in the GDP the percentage of wages of those people who are occupied with these industries (from 30 to 35 %).[1] The mentioned classification of industries, as well as the similar ones, is based on the assumption of homogeneity of labour force within the certain industry (according to both subject and character of performed work).

That's why this industry-centered perspective obscures the trend has taken place from the late 1970s of the XX century when in developed countries the proportion of high-skilled workers turned to get wider (Occupational Employment 2003–2004, p 9–10; Harnad 1991; Hicks and Allen 1999, p 24; Perkin 1990) while their economies were exploring of new technologies which led to the revolution in informational sector in 1980–1990s (Burton-James 1999; Powell and Snellman 2004; Krug 2005; Castells 2004).[2] Moreover the similar classifications assume the late industrial type of socio-economic development of the countries under consideration. However these two assumptions are criticized now.

While analyzing the economies and social relations of industrially advanced countries, Daniel Bell concludes that the present and near-future development of western, predominantly American, society cannot be explained or predicted by the late industrial development model characterized in terms of a large share of social services and the production of food and pharmaceutical industries in the GDP structure. This is due to the fact that, eventually, intellectual services became separated from service industries (Singelmann 1978). And the development of information technologies, which require the creation of new types of employment positions, has led to an obvious differentiation of the once homogeneous group of non-manual workers into the high-skilled intellectuals on the one hand and so-called 'generic' workforces, on the other (Castells 2004).

To describe the new phenomenon, D. Bell introduced the notion of a postindustrial society (Bell 1999).[3] The market bargaining force in such a society is

[1] The data are representing the following countries: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Norway, Portugal, Sweden, Great Britain, USA (World Economic Outlook 2007, p 182)

[2] This trend is also observed on the upward phase of the fifth Kondratieff wave that was caused by the rearrangement of the US economy during the depression in the mid-1970s. Later accumulation of capital has been encouraged by the shift from production to financial manipulations (Wallerstein 2009) that facilitated in developed countries employment of consultants and relative specialists in later 1990s (see Table 1). The idea of a correlation between Kondratieff waves each of one is characterized by a certain domain sector or sectors, technological system and culture, or so-called techno-economic paradigm (Kapas and Czegledi 2007), was generated firstly by I. Schumpeter. This idea became a major of his theory about the waves of technological innovations. Empirical verification of the assumption is accomplished by (Kleinknecht and Van der Panne 2006, p 118–127).

[3] D. Bell considers a postindustrial society to be knowledge based one to the same extent as an industrial society to be a goods-producing one (Bell 1999: 467). Meanwhile, the term ''post-industrial society'' is not the only one that scholars use to describe the processes occurring in economic and social spheres of the modern world. There are the notions of a ''programmed society'' (Touraine 1971), a ''society of services'' (Singelmann 1978; Fuchs 1968), and even such metaphors as a ''weightless society'' (Leadbeater 2000), and etc.

based upon competitive knowledge and competences, which are the main assets of a knowledge-based economy (Burton-James 1999; Leitch Review of Skills final report 2006; Machlup 1962; OECD 2000; Perry et al. 1971), as well as upon creative potential[4], and for which the key determinants of social and economic development are not only industrial relations[5] themselves, but rather their place in the social division of labor primarily associated with such occupations as a teacher, an engineer, or an art and cultural worker. It was through a study of the changes in the occupational structure of American society during the 19th to 20th centuries (1848–1960) that had been caused (in D. Bell's opinion, based upon Fritz Machlup's above mentioned work concerning this dynamic's analysis) by an enhancement in the importance of knowledge and information that allowed this Harvard professor to forecast future tendencies in this sphere.

It is particularly remarkable that the significance of the working population's occupational structure as a subject of research involving even larger scale purposes (for example, to assess a social development's potential) still has not only a theoretical, but also a practical basis. For instance, it was shown how and to what extent the changes in the occupational structure of American society determine inequality and social mobility in the USA in the latest edition of Dennis Gilbert's book, The American Class Structure in an Age of Growing Inequality (Gilbert 2010), based upon the methods and concepts[6] developed by American researchers Peter Blau and Otis Duncan (1967).

The separation of the population employed in different occupational positions in the modern Russian economy taken as an object of study raises the question of whether the nature of the occupational structure as a stand-alone phenomenon is social or economic. There are some authors who differentiate between the 'economic' and 'occupational' notions of a knowledge society, associating 'professional' with 'social'. For instance, Frank Webster (2006) distinguishes five concepts of a knowledge society. These include a technological concept (Ess and Sudweeks 2001; Krug 2005; Naisbitt 1994; Toffler 1990), an economic concept (Jonscher 1999; Machlup 1962; Porat 1977), a professional concept (Bell 1999; Castells 1996, 1997, 1998; Drucker 1969; Gouldner 1978; Kumar 1978; Leadbeater 1999; Perkin 1990; Reich 1999), a space concept (Castells 1996; Jenkins 2006; Urry 2000; Wellman and Haythornthweait 2002), and a cultural concept (Castells 2004; McLuhan 1962, 2002; Poster 1990 etc.).

Meanwhile, the authors agree that these concepts do not exclude one another. Moreover, even within the technological framework of a knowledge society that some of the above mentioned authors hold, it is perceived as being a part of the social concept. The understanding of a knowledge society in terms of its activities presupposes that there are new types of production activities that appear and become

[4] It's worth noting that the so-called concept of a creative class (a class of creative workers) as an independent subject of the social and economic life of modern society has become widespread during the past 20 years.

[5] Industrial (or production and economic) relations are likely to be regarded as an independent factor of social and economic development; for example, in neo-Marxist analysis, in which they are derived from relations involving the ownership of capital goods.

[6] Foremost, path analysis is meant.

dominant, and these require a person to demonstrate features of character that were not in demand in the era of early or even late industrial development.[7] To support and develop the skills and traits of character required to perform new types of work, it's necessary to create an appropriate system of work relationships and locations. And in this respect, the professional aspect of the labor potential of an occupied population should be considered as a part of the ''social'' aspect in society. At the same time, a framework of jobs filled with employees of a certain quality connects occupational structure to the economic domain of a society. Thus, the occupational structure should be regarded as a socio-economic phenomenon.

D. Bell describes a knowledge society as a society in which activities are predominantly associated with 'informational work' (Bell 1999, p 217). The occupational composition of the work force transforms towards a sharp increase in professionals and technical staff (Kumar 1978, 185–240; Porat 1977). To the extent that traditional jobs created to satisfy the needs of material production and common services are being replaced by machinery production and skilled labour, both new types of work and jobs are getting to appear, and information becomes the working capital, more widely than material objects, as was formerly the case (Unwin 1904). Ideas, knowledge, skills, talent and individual ''creativity'' (Regini 2010) become leading factors in the value-added chain, and determine growth in prosperity and personal success. The latter becomes systematic when an economy's advancement is assured by a group of professions and occupations, the representatives of which are able to deal with high-technology processes, information and ideas and know how to produce, systematize and disseminate them.

Studying the countries of Western Europe, the USA, and Japan, many researchers give the leading role in the economy to the type of employee whose work has a special content, but the form of which differs in a high extent, on the one hand. This is reflected in the various terms used to describe such workers (namely, an ''informational worker'' (Castells 2004), a ''knowledge expert'' or a ''symbolic analyst''). But, on the other hand, this form remains constant, and consists foremost of the ability, as was mentioned above, to create and systemize information as well as to operate high-technology equipment. Here one can speak of new types of employment compensation for minor groups of (key) workers and ''spot contracts'' for the majority (Goldthorpe 2000, p 1580; Morgan and McKerrow 2004; Murphy 1990; Sorensen 2000, p 1554), or, on the contrary, stay with a neo-Marxist position, sticking to the idea of the proletarization of professionals and other non-manual workers in modern bureaucratic organizations (Larson 1977; Standing 2011). However in any way, the trend seems to be obvious.

As has existed in the USA since 1979, the income range of skilled and unskilled workers (Brown 2007) indirectly justifies the opinion accepted in Western European literature. According to this opinion, the occupational status of employees, based upon the characteristics of a job performed by a person and his/her employment

[7] For instance, in Charles Leadbeater's (author of Living on Thin Air) opinion, to become successful in a ''weightless economy'', one need to be quick-witted, clever and inventive, and possess the possibility of developing and supporting networks (Leadbeater 1999).

situation, is a governing factor in social product distribution, and correspondingly, the determination of the structural features of the population's labour potential.

Gradually, together with the enhancement of the role of information and knowledge in value-added production, the advancement of high technologies, the growth of capital, and the workforce's mobility, traditional employment structures, as well as organizational and personal investments, are condemned either to systemic transformation (which often presupposes strong political will and the availability of traditions facilitating change), or to gradual decomposition (accompanied by the transplantation of institutes). To a large extent, the first way of adaptation to productive forces and external market conditions was remarkable feature of industrially developed countries, such as England (the reorganization of traditional industries introduced by M. Thatcher), Germany (the social market economy (Soziale Marktwirtschaft) of R. Erhard), Japan (the Ministry of Commerce and Industry's policy), the USA (the reforms to the educational system in the 1930s, and others). The second strategy was chosen by those countries forming the protocore (BRICs) and semi-periphery of the global world-system, according to Wallerstein's terminology.

The chosen strategy, which in many ways reflects the predominant character of social relations, leads the population, first of all, to develop a certain occupational structure and a corresponding system of competences (Dunkerley 1975; Chen 1947; Hausermann 2010; Hennock 2007; Kohler and Zacher 1982; Soskice et al 2001). To better understand the character and prospects of a mode of country's socioeconomic development, there are two main indicators that should be taken into account: (a) proportions in the occupational structure; (b) nature of work, the extent of labor division according to specialization and qualification. Within the certain historical framework these indicators produce the criteria to distinct different types of socio-economic development and arrange them in consistent order (see Table 1). The scheme presented on Table 1 sums up the trends mentioned above under the column PTI—''post-industrial stage of socio-economic development''. While evaluating the mode of socio-economic development of Russia this column is supposed to be o kind of analytical reference category. It could be so because the Russian officials declared the modernization as a strategic goal for the further decades. Since the modernization implies a destination the reference point of the desirable mode of socio-economic development should be set up. In terms of labour potential approach modernization is a transition, say, from LI (''late industrial phase of economic development'') to PTI by arranging the population to the definite article qualitatively new jobs.

The engagement of the population in industries that require from their employees the constant development of their human capital assets, and with the condition that there are certain traditions and work skills acquired during the process of the available education, can encourage the advancement of a workforce's quality (Oesch and Rodriguez 2011; Perales 2010; World Economic Outlook 2007; Wyatt and Hecker 2006). Otherwise, the localization of labor in the secondary employment sector, enhanced by the territorial and industrial specificity of national labor markets, will lead only to a deeper degradation of the available human resources'

labor potential and lower the chances of a given society to integrate successfully into the global economy.

Transformation of the Occupational Structure of Russian Society in the Period between 1994 and 2010

Taking into account the correlation between the type of socio-economic development and the occupational structure as shown in Table 1, it's reasonable to pose a question concerning what the occupational structure of the workforce in Russia and its dynamics in the period from 1990s to the 2000s have been like. What are the main trends for the sizes of the different professional groups and what do they show from the viewpoint of the further social and economic development of the country and its successful modernization?

Since the end of the 1960s, the growth of a wide group of intellectual workers in Russia (the USSR) was slowed down (Volkov 1999) primarily due to curtailment of the ''Kosygin reforms'' in mid-1960s. As a result, both high-skilled manual workers and specialists performed work of a level that was lower than their education and qualification. In the USSR such a crotch was about between 10 and 50 %, depending on a social stratum (Golenkova and Igitkhanyan 1998). That led to a large quantity of semiskilled work positions in the Russian economy by the end of 1980s. According to the sociological data, this trend has stabilized of late (Shkaratan and Yastrebov 2007), although they are in slight contradiction to the data provided by the official Russian statistics.[8] An analysis of these differences made upon the basis of RLMS-HSE panel dataset for the period between 1994 and 2010[9] led to the development of methods to recode the 4-digit positions of the International Standard Classification of Occupations (ISCO-88[10]) what made it possible to create a database describing Russian population's occupational structure in which such distortions[11] are minimized.

[8] Currently, the issue of the occupational structure directly depends upon the methods for measuring an employee's professional status throughout the world.

[9] The analysis was done on ''Russian Longitudinal Monitoring Survey, RLMS-HSE'' data for 1994–2010, conducted by the National Research University Higher School of Economics and ZAO ''Demoscope'' together with Carolina Population Center, University of North Carolina at Chapel Hill, headed by Barry M. Popkin, and the Institute of Sociology RAS (Polina Kozyreva and Mikhail Kosolapov). RLMS is a series of nationally representative surveys designed to monitor the effects of Russian reforms on the health and economic welfare of households and individuals in the Russian Federation. Data have been collected 19 times since 1992. Of these, 15 represent the RLMS Phase II (http://www.cpc.unc.edu/projects/rlms-hse).

[10] The International Standard Classification of Occupations (ISCO-88) is used as a main classification scheme of occupations by ILO. As a result, ISCO-88 is widely used in a number of datasets. The RLMS database is distributed with computed variables in which occupations are already coded and aggregated according to the Classification of Occupations ISCO-88, based upon rules developed in Geneva in 1988 without any adaptation to Russian realities.

[11] Adaptation of ISCO-88 undertaken by the author was based upon the fundamentals of empiric structuralism (Blau 1977), according to which the occupational structure is studied through the range of positions identified in virtue of the most significant characteristics of jobs in modern economy. For further details, see (Anikin 2009).

There are some major tendencies of the Russian population's occupational structure that have been discovered over the period of 1994–2010 (see Table 2). Principally, they are as follows:

- The share of semi-skilled and unskilled non-manual workers increased;
- The quantity of professionals has gone up solely since 2009;
- There was growth in the managerial group, with a high level of inherent instability among this group as compared with the level of stabilization of the composition of other professional groups.
- The share of qualified manual workers (employed as plant and machine operators, assemblers and drivers at Russian enterprises) decreased;

On the whole, the quantitative indices shown on Table 2 demonstrate the Russian economy's de-industrialization and the simultaneous deskilling of the workforce.[12] This means that by looking at the population's occupational structure, one can define the model for the Russian economy's development as belonging to neither the late nor early industrial types. The Russian economy is in transition stage between these two types, which is demonstrated by the incompleteness of the formation of the population's occupational structure, reflected not only in the dynamics of the intensive abundance of some professional groups, but also in the lack of stability in the inner composition of some occupations (managerial staff, for instance) and, moreover, the lack of homogeneity among semiskilled and unskilled manual workers.

In light of this one should firstly examine in more detail the group of executive workers that is currently under the process of shaping its structure in modern Russia. This group is characterized by inner instability (from 2009 to 2010, 57 % of managers retained their positions; for 2 years, 59 %; for 3 years, 54 %; from 2006 to 2010, only half; from 2005, 47 %; from 2004, 36 %; from 1998, 28 %; from 1996, 18 %; and from 1994 to 2010, only 27 % of the group). In other words, the group of officials, managers and entrepreneurs in Russia has almost been completely renewed since the beginning of the 1990s, and this process has not finished yet. And although during the post-Soviet years the structure of executives, officials and entrepreneurs underwent remarkable metamorphoses, the role that professionals took in that transformation was not large. For instance, it is shown in Fig. 1, representing the share of professionals in the composition of managerial staff for different years, that on the whole, the mobility of professionals to managerial positions had little influence upon the managerial/professional group profile, except for certain time-points when the filling of managerial positions by professionals was quite noticeable and expressed itself in the group's image. Thus, within the group of managers of 2008 and 2005 years the share of those workers employed as professionals in 2004 was statistically significant (not less than a fifth of managerial staff for the corresponding years).

[12] The foremost reason for this is a disagreement between the workforce structure and the structure of the positions available, such that many degree holders had to take a position not corresponding in any way with their formal qualifications. (Lukiyanova et al. 2011).

Figure 1 is somewhere here

Figure 1 shows an upward trend in the demand for the specialists with higher education (professionals) since the beginning of the 2000s, and that the demand was satisfied at the peak of economic growth in the middle of the 2000s. Furthermore, it's important to note that this demand was satisfied not so much due to an extensive growth of managerial positions, but to the internal need of organizations to fill already-existing positions associated with managing and supervising people and processes. This is illustrated by the insignificant changes of the executives and managers' share in the employed population starting in 2003, and is demonstrated by official statistical data concerning the dynamics of the corresponding positions during this period.

Given that professionals are the only representatives of other occupations who have at least the slight possibility of taking up a managerial position (and this trend has remained unchanged since the beginning of the 1990s), we can reach the conclusion that the possibility of entering a managerial position primarily depends not upon the professionals themselves, but rather, upon structural changes within organizations and their inner needs that are closely related to this sort of activity. At the same time, professionals demonstrate relative stability in the inner composition of their group. Thus, the share of professionals in the group of intellectual workers was 82 % in 2009, 77 % in 2007, 67 % in 2005, 59 % in 2002, and 64 % in 1994. The remaining percentages are primarily shared by managers, semiprofessionals, office workers, and service workers and shop and market sales workers (see Fig. 2). Moreover, this ratio did not change during the period from 1994 to 2010.

Along with the overall reduction in the number of structural positions of professionals in the Russian economy indicated above, approximately 10 % of the representatives of this group were forced to choose a descending level of social mobility. This was due to the ‘‘washing-off’’ of male employees from professional

Figure 2 is somewhere here

positions, and this contradictory trend specific to Russia makes one think of the attractiveness of professional positions in this country (Anikin 2012). In other words, if the mobility to managerial positions might be connected to the prospects associated (primarily for former professionals) with the transition to organizational activity, which requires, but is not limited to, the skills of having a strategic perception towards a problem and the acquiring of appropriate roles, then the transition of professionals to lower levels of social ranking leads to the conclusion that the labour potential of a portion of degree-holding specialists is used irrationally in modern Russia and in the specific character of the corresponding positions within the existing occupational structure. At least compared to the situation in mature economies, in which the jobs of professionals are traditionally considered to be the most attractive.

As far as the advanced economies are concerned there are the trends they represented several decades ago (Table 1) that had something in common with what is going on in modern Russia. It is shown in Table 2 that the dynamics of the quantity of the Russian population engaged in manual work demonstrates that the Russian economy is coming through de-industrialization. However, ‘‘blue collars’’ (predominantly industrial workers with the core positions of operators, assemblers and drivers, as well as elementary occupations) is likely to be the most stable group in terms of preserving its inner composition (from 2009 to 2010, 81 %, and from 1994 to 2010, 69 % of industrial workers retained their positions, correspondingly). At the same time, there is also a pronounced internal inhomogeneity amidst the manual workers group, which shows itself in an analysis of the economic activities of these occupations. For example, a typical sector of employment for unskilled manual workers is not an industry, but branches of a tertiary sector (47 % of all elementary occupations are employed in such sectors) such as sphere of intellectual services (primarily on positions of security guards and drivers), trade and consumer services, and security, in which the character of the unskilled non-manual workers’ activity differs greatly from the one occupied in industry, construction or agriculture.

In light of this it's worth noting that interpenetration of the statuses of industrial workers and elementary occupations has been decreasing over the years (from 22 % of the number of unskilled workers in 2010 who were plant and machine operators, and assemblers in 1994, to 6 % of the number of elementary occupations in 2010 who were plant and machine operators, and assemblers in 2009). At that, if during the 1990s the transition of industrial workers to elementary occupations was not related to the specific character of those positions associated with unskilled manual labor (statistical correlation was not significant: $p<0.05$[13]), then starting from 2003, the mobility of plant and machine operators, and assemblers to elementary occupations became very uncharacteristic of the former group. This shows that the main statuses of those occupied with non-manual work are taking more shape, and this trend includes even those associated with quite low skills and educational requirements (see Table 3). Partially, this is caused by the transferring to Russia of some industries that require their employees to be socialized within a certain technological culture. In practice management of such enterprises prefers to fill the positions of operators and assemblers with workforce of an educational level no lower than tertiary one, rather than to invest in the retraining of low- and unskilled workers. Incidentally, the existence of such enterprises (including those of MIC) makes it easier to explain why there are the workers with higher education at the positions of ''blue collars''. It might be possible that this minor group of skilled workers will become in greater demand by Russian industry, especially if international corporations continue to transfer their assembly lines to Russia.

Generalizing the trends, it should be noted that the occupational structure of Russian society has stabilized of late; however, this stability has controversial consequences. As was shown above, there are remarkable limitations of upward professional mobility of Russian population that may decrease the stimuli of workers to upgrade their knowledge and accumulate skills necessary for innovative production (Anikin 2012). Meanwhile, Russian economy has not been effectively rearranged towards the system with innovation and high-technology oriented structure over the recent post-Soviet period. Notwithstanding the slow deindustrialization there is still relatively small and constant number of skilled professionals signed up by the enterprises in Russian economy during the last 15 years; in contrast with the steady long-run upward trend in the quantity of semi- and low-skilled non-

[13] While the cross-tabulations are analyzed the criterion of statistical significance is presented by the deviance (residual) of observed count from expected count that is measured in terms standard deviation (Adjusted Residual [Zij = (Nij – Eij) / σij]). As the variables are assumed to be independent from each other, the following assumption should work – the more observations we have the more likely the random quantity will be normally distributed with expected value of zero and variance equal to one: N ~ (0,1). Standard deviation is calculated under the assumption that Nij is random quantity with distribution $\sigma_{ij}^2 = \{N_{i\cdot} \cdot N_{\cdot j}(N - N_{i\cdot})(N - N_{\cdot j}) / N^2 \cdot (N-1)\}$. It is scarcely possible for Zij to have more than three deviations, as the probability of such an outcome is less then 0,0027 (lower 0,27% from 100%, according to the Three-sigma rule). That's why when one obtains the value of Zij more than 3, it is general practice to accept that *i* and *j* values of X and Y are bounded. Meanwhile, usually the given criteria are weakened to the significance level of 5% (1,65σij). If Adjusted Residual ≥ 2.0, then it corresponds to the significance level of accepting the null hypothesis (that there is no relationship between two measured phenomena) with the probability level of 5%, $p < 0.05$; if Adj. Res. ≥ 2.6, then $p < 0.01$; when Adj. Res. ≥ 3.3, $p < 0.001$.

manual workers. In light of this, the transformation of Russia is likely to be a protracted transition from the industrial phase of economic development (I in terms of Table 1) to the late industrial one (LI). An interminable character of this transition is presented in doing the first step and failing to make the further. In Hegelian terms it means negation of a previous stage of development however sticking in chronicle incapacity for a qualitative leap to the further mode of development. Such a qualitative leap is supposed to be a socio-economic modernization. But without more structural reforms and funding in high-skilled jobs, it will just be pie in the sky.

Conclusion and Discussion

To sum up, analysis of the dynamics of employed population gives wide opportunities for the identification and describing the main stages of socioeconomic development of a country, including Russia. Moreover, the given scheme of correlation between occupational structure changes and type of socio-economic development might be rather helpful for comparative studies; especially while analyzing the limitations and forecasting countries' possible development trends. The analysis of occupational structure of Russian population shows that the reforms of 1990s have facilitated the process of deindustrialization alongside with the growth of semi- and low-skilled jobs. According to the scheme, Russia seems to be at the stage of the development that is somewhat similar to one of the 1950–1960s in the USA and the Europe, correspondingly.

Applying to this analytical scheme in modern studies makes it easier to understand how effective were the reforms of the 1990s in light of inclusion of the Russian economy onto the system of international labour division, global trade, and the allocation of corresponding rents. In other words, such a point of view on occupational structure let one to adjust the focus of the analysis of the evolution of the labour force quality in modern Russia from the perspective of the following question—to what extent the employed population of Russia might be a core of 'knowledge based economy'?

The main analytical limitation of the scheme is associated with these assumptions (1) indicator of socio-economic development is supposed to be a concept of industrialization; (2) different countries pass through the similar stages of development changeable by the subsequent moving from one to another; (3) and about the comparability of occupational structures. Meanwhile, as was shown above, the concept of industrialization might be a highly relevant analytical instrument. What about proper measurements of occupational structure, it should be noted that International standard of classification of occupations ISCO-88, produced by the ILO for comparative studies amidst the economically advanced countries could be an adequate alternative to local classifications.

As s a result, considering the occupational structure as an indicator of socioeconomic processes makes it possible to identify the consistent patterns in public policy with respect to the particular groups of the national work force. Facilitating the growth of labour potential of a certain quality has become a key point in governing the socio-economic development in industrially advanced countries.

Without realizing this relationship it becomes harder to go beyond the transition phase and build-up a knowledge economy, and therefore to gain a foothold for a consistent development of the late industrial stage.

References

Anikin VA (2009) Social and occupational structure in Russia: Methodology and trends. In: Mansurov VA et al (eds) Professional groups in modern society: Dynamics and transformation. Institute of Sociology RAS Publisher, Moscow (in Russian)

Anikin VA (2012) The modernization potential of the professional structure of the employed population of Russia. Sociological research Vol. 51, No.6, pp 44–80

Bell D (1999) The coming of post-industrial society: A venture of social forecasting. Basic books, New York

Blau P (1977) Inequality and heterogeneity: a primitive theory of social structure. Free Press, New York

Blau P, Duncan O, Tyree A (1967) The American occupational structure. Wiley, New York

Broom L, Smith JH (1963) Bridging occupations. The British Journal of Sociology, Vol. 14, No. 4, pp 321–334

Brown RM (1924) Occupations in the United States. Scientific Monthly, Vol. 18, pp 196–204

Brown DK (2007) Globalization and employment conditions study. Social Protection Discussion Paper No. 0708, April. The World Bank, Washington DC

Bucher K (1901) Entstehung der volkswirtschaft. Erste summlung. Laupp, Tu¨bingen (in English in: Industrial Evolution, trans. Wickett SM (1912). H. Holt and Company, New York)

Burton-James A (1999) Knowledge capitalism: Business, work, and learning in the economy. Oxford university press, New York

Castel R (1995) Les Metamorphoses de la question sociale: Une chronique du salariat. Fayard, Paris

Castells M (1996) The rise of the network society: The information age: Economy, society and culture, vol I. Blackwell, Oxford

Castells M (1997) The power of identity: the information age: Economy, society and culture, vol II. Blackwell, Oxford

Castells M (1998) The end of the millennium: The information age: Economy, society and culture, vol III. Blackwell, Oxford

Castells M (2004) Informationalism, networks, and the network society: a theoretical blueprint. In:

Castells M (ed) The network society: A cross-cultural perspective. Edward Elgar Pub, Northampton

Chen Ta (1947) Occupations. The American Journal of Sociology, Vol. 52, Supplement: Population in Modern China

Commerce Yearbook (1928) United States Department of Commerce. US Govt. Print. Off

Drucker P (1969) The Age of discontinuity. Heinemann, London

Dunkerley D (1975) Occupations and society. Routledge & Paul, London-Boston

Ess Ch, Sudweeks F (eds) (2001) Culture, technology, communication: towards an intercultural global village. State university of New York press, New York

Fairbairn I (1967) More on the labor potential—Some evidence from Western Samoa. Economic Development and Cultural Change, Vol. 16, No. 1, pp 97–105

Fuchs C (1968) Internet and society: Social theory in the information age. Routledge, New York

Gilbert D (2010) The American class structure in an age of growing inequality, 8th edn. Pine Forge Press, London

Goldthorpe JH (1980) Social mobility and class structure in modern Britain. Clarendon Press, Oxford

Goldthorpe JH (2000) Symposium on Class analysis: Rent, class conflict, and class structure: a commentary on Sorensen. The American Journal of Sociology, Vol. 105, No. 6, pp 1572–1582

Goldthorpe JH (2002) Occupational sociology, yes: Class analysis, no: Comment on Grusky and Weeden's research agenda. Acta Sociologica, Vol. 45, No 3, pp 211–217

Goldthorpe JH et al (1969) The affluent worker in the class structure. Cambridge university press, New York

Golenkova Z, Igitkanyan E (1998) Chapter 4. Social structure and stratification. In: Yadov VA (ed) Sociology in Russia. Institute of Sociology of Russian Academy of Science, Moscow

Gouldner A (1978) The new class project II. Theory and Society, Vol. 6, No. 3, pp 343–389
Handbook of Labor Statistics (1924–1926) United States Department of Labor, Bureau of Labour Statistics. U.S. Govt. Print. Off
Hansen AH (1922) Industrial classes in the United States in 1920. Journal of the American Statistical Association, Vol. 18, pp 503–506
Hansen W (1963) Professional engineers: Salary structure problems. Industrial Relations: A Journal of Economy and Society Vol. 2, Issue 3, pp 33–34
Harnad S (1991) Post-Gutenberg galaxy: The fourth revolution in the means of production of knowledge. The public-access. Computer Systems Review Vol. 2, No. 1, pp 39–53
Ha¨usermann S (2010) The politics of welfare state reform in continental Europe: modernization in hard times. Cambridge university press, New York
Hennock E (2007) The origin of the welfare state in England and Germany, 1850–1914: Social policies compared. Cambridge university press, Cambridge
Hicks J, Allen G (1999) A century of change: Trends in UK statistics since 1900. Research Paper 99/111, December 21. House of Commons Library. Social and General Statistics Section, p 24
Jenkins H (2006) Convergence culture: Where old and new media collide. New York university press, New York
Johnes MZ (1925) Trend of occupation in the population. Monthly Labor Review, No. 5, pp 14–22
Jonscher C (1999) The evolution of wired life: From the alphabet to the soul-catcher chip- how information technologies change our worlds. Wiley, New York
Kapas J, Czegledi P (2007) What does transition means? post-socialist and Western European Countries paralleled. The Journal of Comparative Economic Studies (JCES), Vol. 3, pp 3–28
Kleinknecht A, Van der Panne G (2006) Who was right? Kuznets in 1930 or Schumpeter in 1939? In: Devezas TC (ed) Kondratieff waves, warfare and world security. IOS Press, Amsterdam
Kohler P, Zacher H, eds. (1982) The evolution of social insurance, 1881–1981: studies of Germany, France, Great Britain, Austria, and Switzerland. F. Pinter/St. Martin's Press on behalf of the Max-Planck-Institut fu¨ r Ausla¨ndisches und Internationales Sozialrecht, London/New York
Krantz L (2010) Jobs rated almanac. St. Martin's press, New York
Krug G (2005) Communication, technology and cultural change. Sage, London
Kumar K (1978) Prophecy and progress: The sociology of industrial and post-industrial society. Penguin Books, Harmondsworth
Larson M (1977) The rise of professionalism: A sociological analysis. University of California press, Berkeley
Leadbeater Ch (1999) Living on thin air: The new economy. Viking and Penguin, Harmondsworth
Leadbeater Ch (2000) The weightless society: living in the new economy bubble. Texere, New York
Leitch Review of Skills final report (2006) Prosperity for all in the global economy—world class skills. TSO (The Stationary Office), Norwich
Lindert PH (1980) English occupations, 1670–1811. The Journal of Economic History, Vol. 40, No. 4, pp 685–712
Lukiyanova AL, Gimpelson VE, Kapeliushnikov RI (2011) A Russian employee: Education, occupation, qualifications. Publishing house of the Higher School of Economics, Moscow (in Russian)
Machlup F (1962) The production and distribution of knowledge in the United States. Princeton university press, Princeton
McLuhan M (1962) The Gutenberg galaxy: the making of typographic man. University of Toronto press, Toronto
McLuhan M (2002) The mechanical bride: Folklore of industrial man. 1st edn. The Vanguard Press, reissued by Gingko Press, New York
Mills CW (1951) White Collar: The American middle class. Oxford university press, New York
Morgan S, McKerrow M (2004) Social class, rent destruction, and the earnings of black and white men. In: Kalleberg AL et al (eds) Inequality: Structures, dynamics and mechanisms, Essays in honor of Aage B. Sorensen. Elsevier Ltd, Oxford, pp 1982–2000
Murphy R (1990) Proletarization or bureaucratization: the fall of the professional? In: Torstendahl R, Burrage M (eds) The formation of professions. Knowledge, state and strategy (Advanced studies in the social sciences). SAGE Publications, London
Naisbitt J (1994) Global paradox: The bigger the world economy, the more powerful its smallest players. W. Morrow, New York
Occupational Employment (2003–2004) Occupational Outlook Quarterly, Vol. 47, No. 4, pp 8–11
Occupational Employment (2009–2010) Occupational Outlook Quarterly, Vol. 53, No. 4, pp 8–9
OECD (2000) Literacy in the information age: Final Report of the International adult literacy survey. OECD, Paris

Oesch D, Rodriguez MJ (2011) Upgrading or polarization? Occupational change in Britain, Germany, Spain and Switzerland, 1990–2008. Socio-Economic Review, Vol. 9, No. 3, pp 503–531
Ogburn W, Tibbitts C (1929) Occupations. The American Journal of Sociology, Vol. 34, No. 6, pp 1169–1180
Perales F (2010) Occupational feminization, specialized human capital and wages: evidence from the British labour market. ISER Working Paper Series, No. 31, pp 1–49
Perkin H (1990) The rise of professional society: England since 1880. Routledge, London
Perry G, Denison E, Solow R (1971) Labor force structure, potential output, and productivity. Brookings Papers on Economic Activity, Vol. 1971, No. 3, pp 533–578
Porat M (1977) The information economy. US Department of Commerce, Washington DC
Poster M (1990) The mode of information: Poststructuralism and social context. University of Chicago press, Chicago
Powell W, Snellman K (2004) The Knowledge economy. Annual Review of Sociology, Vol. 30, pp 199–220
Regini M (2010) The increasing individualization of work and labour. Socio-Economic Review, No. 8, pp 341–376
Reich R (1999) The political paradox of inequality. http://www.hks.harvard.edu/inequality/
Routh G (1987) Occupations of the people of Great Britain 1801–1981. Macmillan, London
Shkaratan OI, Yastrebov GA (2007) Social and occupational structure of the population of Russia. Theoretical background, methods and some of the results of reexaminations in 1994, 2002 and 2006. The Universe of Russia. Vol. XVI, No. 3, pp 3–49
Singelmann J (1978) From agriculture to services: The transformation of industrial employment. Sage Publications, California
Sorensen AB (2000) Toward a sounder basis for class analysis. The American Journal of Sociology, Vol. 105, No. 6, pp 1523–1558
Sorokin P (1927) Social Mobility. Harper & Brothers, New York
Soskice D, Estevez-Abe M, Iversen T (2001) Social protection and the formation of skills: a reinterpretation of the welfare state. In: Soskice D, Hall P (eds) Varieties of capitalism: the institutional foundations of comparative advantage. Oxford university press, Oxford
Standing G (2011) The precariat: The new dangerous class. Bloomsbury Academic, London. Summer/Summer99/summer1999.htm. Accessed 20 November 2012
Tawney AJ, Tawney RH (1934) An occupational census of the seventeenth century. Economic History Review, No 5
Toffler A (1990) Powershift: Knowledge, wealth and violence at the edge of the 21st century. Bantam Books, New York
Touraine A (1971) The post-industrial society. Tomorrow's social history: Classes, conflicts and culture in the programmed society. Random House, New York
Unwin G (1904) Industrial organization in the sixteenth and seventeenth centuries. Clarendon press, Oxford
Urquhart M (1984) The employment shift to services: where did it come from? Monthly Labor Review, April, pp 15–22
Urry J (2000) Sociology beyond societies: Mobilities for the twenty-first century. Routledge, London
Volkov SV (1999) Social stratum of intellectuals in Soviet society. INION RAN, Moscow (in Russian)
Wallerstein I (2009) Dynamics of (unresolved) global crisis: Thirty years later. Report on Plenary Session #5, 39th World Congress of the International Institute of Sociology, June 13, Yerevan, Armenia. http://www.inop.ru/files/valer_politeh.pdf. Accessed 20 November 2012
Webster F (2006) The information society, 3rd edn. Taylor & Francis, Abingdon
Wellman B, Haythornthweait C (eds) (2002) The internet in everyday life. Blackwell, Oxford
Woollard M (1999) The classification of occupations in the 1881 census of England and Wales. Occasional Paper No. 1. Historical Censuses and Social Surveys Research Group, University of Essex, Colchester
World economic outlook (2007) Spillovers and cycles in the global economy. International Monetary Fund, Washington DC
Wyatt I, Hecker D (2006) Occupational changes during the 20th century. Monthly Labor Review, March, pp 35–57

Table 1 Criteria of Correlation between Occupational Structure Changes and Type of Socio-Economic Development

	PI	EI	I	LI	PTI
Historical framework	**In Western Europe**: from the 14th century (feudal system decay to the west of the Elbe) until the first quarter of the 18th century	**In Western Europe** (England): the second quarter of the 18th century until the first half of the 19th century; In the **USA** (northern states): from the end of the 18th century until the end of the 19th century	**In Western Europe**: from the middle of the 19th century until 1950s (in England); to1960s (in continental Europe, due to World War II); In the **USA**: from the end of the 19th century until the 1940s	**In Western Europe**: 1960-1990; In the **USA**: from 1940-1950 until the 1970s	**In Western Europe**: from 1980-1990 until the present; In the **USA**: from the end of the1970s until the present
Proportions in the occupational structure	Predominance in the economy of ground laborers (peasants); workers engaged in foraging, hunting and fishing; crafts associated with the lay of the land; handicraftsmen	Predominance in the economy of low-skilled workers engaged in homogeneous manual work on farms, in forestry, in fishing, at factories and plants, in transport, in trade, and in consumer services	Predominance in the economy of industrial workers primarily engaged in conveyor-type production; growth in the number of agents and administrative staff performing routine tasks in offices	Predominance in the economy of non-manual workers: officials, technical staff, engineers, doctors, school teachers, and insurance and real-estate brokers	Predominance of professional managers and technical experts, represented by such occupations as advisers, computer specialists, researchers, analysts, and qualified technical staff; a small share of workers and representatives involved in unskilled, routine work
Nature of work, the extent of labour division according to specialization and qualification	Most simple, unskilled, homogeneous and universal labor of a physical character	Universal, homogeneous labor, low level of qualifications, low professional differentiation	Skilled and semiskilled labor, differentiation of workers according to qualifications and specialty, formation of a wide group of non-manual workers; formation of a narrow stratum of intellectual workers	Highly-specialized labor, high-scaled differentiation according to qualifications, as well as the character and content of the performed work, both between professional groups and within them	Highly skilled labor with broad specialization, high professional differentiation of intellectual labor, a new criterion of creativity is included within qualifications; with automation of production processes, unskilled, routine work is disappearing
References	Bucher 1901; Castel 1995; Lindert 1980; Tawney and Tawney 1934; Unwin 1904	Brown 1924; Commerce Yearbook 1928; Handbook of Labour Statistics 1924–1926; Hansen 1922; Johnes 1925; Ogburn and Tibbitts 1929; Routh 1987; Sorokin 1927 Urquhart 1984	Blau and Duncan 1967; Hansen 1963; Mills 1951; Routh 1987; Woollard 1999	Broom and Smith 1963; Goldthorpe et al. 1969; Goldthorpe 1980; Hicks and Allen 1999; Kumar 1978; Larson 1977; Perkin 1990; Perry et al. 1971; Routh 1987; Singelmann 1978; Wyatt and Hecker 2006	Bell 1999; Brown 2007; Burton-James 1999; Castells 1996, 1997, 1998; Gilbert 2010; Harnad 1991; Krantz 2010; Morgan and McKerrow 2004; Oesch and Rodriguez 2011; Occupational Employment 2003–2004, 2009–2010; Ibid 2009; Perkin 1990; Porat 1977; Powell and Snellman 2004; Regini 2010; Touraine 1971; Urry 2000; Wallerstein 2009

Notations used in the table: PI pre-industrial economy; EI early industrial economy; I transition phase of economic development from early to late industrial; LI late industrial phase of economic development; PTI post-industrial phase of development

Table 2 Occupational Structure of the Russian population in 1994−2010, % from employees (RLMS-HSE representative extracts, ISCO-88 after recoding)

	1994	**1995**	**1996**	**1998**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Wave	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Total, N	4724	4403	4073	3706	3554	3699	3660	3615	3730	3485	4654	4608	4464	4299	7712
0. Armed forces	1,2	1,2	1,5	1,1	1,1	0,8	0,7	0,7	0,6	0,5	0,7	0,7	0,6	0,6	0,5
1. Officials, managers, entrepreneurs (executives)	4	5	3,9	4	5,1	6	5,3	4	4,3	4,4	4,1	5	3,6	3,7	3,2
2. Professionals	13,6	11,5	12,4	12,6	12	12,4	11,8	12,6	12,9	12,2	12,7	13,5	12,5	13,2	15,3
3. Technicians and associate professionals (semi-professionals)	13,4	14	14,6	15,4	14,8	14,9	16,5	16,6	16	17,2	17,3	16,2	18,5	18,9	19,2
4. Office workers, clerks	6,9	7,6	7,4	8	7,3	7,5	8,1	7,8	6,9	6,7	7,3	7,1	7,3	6,9	6,8
5. Service workers and shop and market sales workers	8,2	9	9,3	9,4	10,3	10,2	9,8	10,7	10,5	10,7	10,5	11,5	11,3	11,9	12,3
6. Agricultural and fishery workers	0,6	0,4	0,5	0,5	0,7	0,6	0,7	0,5	0,5	0,6	0,5	0,3	0,3	0,3	0,4
7. Craft and related trades workers	16,7	16,6	16,1	14,4	15,2	15,3	14,9	14,8	15	14,7	13,9	14,5	13,4	12,7	12,6
8. Plant and machine operators, assemblers and drivers	20,9	21	19,3	19,9	19,7	19,3	19	18	19,2	18,4	17,9	16,5	16,9	15,3	15,5
9. Elementary occupations (unskilled workers)	14,5	13,7	15	14,7	13,8	13	13,2	14,3	14,1	14,6	15,1	14,7	15,6	16,5	14,2

Table 3 Education of different occupations in 2010, % (RLMS-HSE representative extracts, ISCO-88 after recoding)

	Education					
Occupational groups	Primary education (0-6 grades)	Not graduated secondary education (7-8 grades)	Not graduated secondary education (7-8 grades) & sth. else	Graduated secondary education	Vocational education and training (VET), or career and technical education (CTE)	Higher education & sth. else (MA, MSc, PhD etc.)
Total N,	14	217	547	2498	2119	2359
%	0,2	2,8	7,1	32,2	27,3	30,4
0. Armed forces				30	20	**50** **
1. Officials, managers, entrepreneurs (executives)		1	2	15	26	**56** ***
2. Professionals					1	**99** ***
3. Technicians and associate professionals (semi-professionals)					**54** ***	**46** ***
4. Office workers, clerks		2	4	**50** ***	28	15
5. Service workers and shop and market sales workers		1	3	**55** ***	36	5
6. Agricultural and fishery workers				58	24	18
7. Craft and related trades workers		1	8	**54** ***	27	10
8. Plant and machine operators, assemblers and drivers		**6** ***	**12** ***	**54** ***	23	6
9. Elementary occupations (unskilled workers)	1	**10** ***	**25** ***	**40** ***	17	6

One austerick (*) means that the null hypothesis is rejected on the significance level $p < 0,05$, i.e. in 95% of the cases one can accept the relationship between the measured phenomena; ** suggests $p < 0,01$ (99%); *** means $p < 0,001$ (with 99,9%).

Bold values indicate statistically significant results (when $p<0.05$)

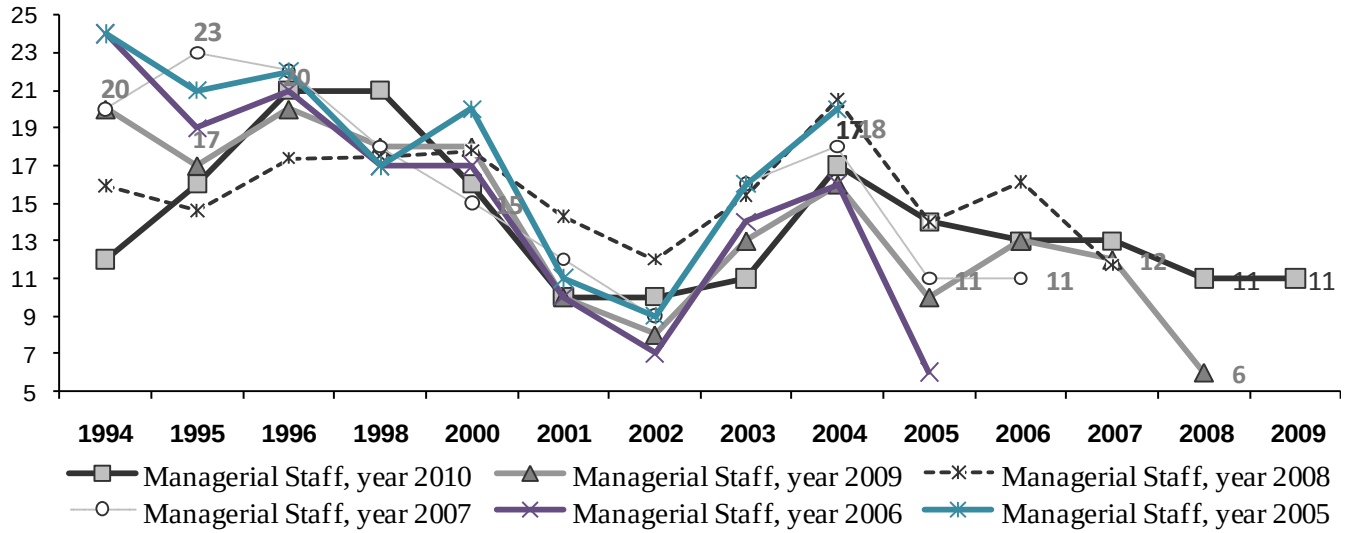

Fig. 1 The share of workers occupying the positions of professionals in different years among the Managerial and Officials in 2010, 2009, 2007, 2006, and 2005, % (RLMS panel extracts) In this picture, only statistically significant figures of the shares of employees occupied in managerial positions who held professional positions in the corresponding year are shown ($p<0.05$). The data concerning the significance level were gained upon the basis of z-statistics values (‘‘Adjusted Residual’’ in some statistical packages (SPSS)), used in the contingency tables data output based upon a Chi-square test.
Please, see the footnote 13 for further details

Fig. 2 Annual Mobility of Professionals to the Groups of Managers, Semiprofessionals and Service Workers and Shop and Market Sales Workers in 1994–2010, % (RLMS-HSE panel extracts). This figure shows the annual mobility of professionals to the groups of managers, semiprofessionals and service workers and shop and market sales workers. For example, the point of 1995 shows the share of professionals in 1994 that moved to the corresponding groups by 1995. The point of 1996 shows the share of professionals in 1995 that moved to the corresponding groups by 1996, and so on